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SENSITIVE  
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STATE FOR EEB/CBA/JTHOMPSON, OES/PCI/SMIRZA, AND EAP/RSP  
DEPT PASS TO USTDA/ROSSITER  
DEPT PASS TO EPA  
BANGKOK FOR REO/HHOWARD, USAID/RDMA/SWALTER, AND USTDA/DUNN  
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TAGS: [SENV](#) [EAGR](#) [ENRG](#) [EAID](#) [EIND](#) [CB](#)  
SUBJECT: SEARCHING FOR ENERGY IN CAMBODIA'S WASTE

REF: A) 09 PHNOM PENH 283, B) 09 PHNOM PENH 747

SENSITIVE BUT UNCLASSIFIED

11. (U) SUMMARY. Although large-scale solutions to Cambodia's energy issues have dominated national and regional attention, NGOs and investors are starting to realize the energy potential in the country's farms, trash bins, and landfills. Studies estimate a potential generation of 18,852 GWh per year from all biomass waste products, even half of which is comparable to several of Cambodia's planned hydropower dams. The Royal Government of Cambodia (RGC), NGOs, and private investors have begun to explore this potential through small pilot projects, such as biogas from rice husks, char briquettes from coconut waste, and methane capture from livestock and landfills. With the right support from the U.S., for example through the U.S.-Lower Mekong Initiative (LMI), Cambodia could further develop its clean energy potential, saving money and greenhouse gas emissions. END SUMMARY.

CAMBODA'S ENERGY SECTOR: WOOD AND DIESEL  
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12. (U) Most Cambodians lack access to reliable energy supplies, making cooking and transportation the primary forms of energy consumption. Wood alone drives 80% of Cambodian energy use, partially for commercial purposes but primarily through direct burning or charcoal combustion in domestic cooking stoves, a traditional Cambodian preference. According to environmental NGO Geres, 90,000 tons of wood charcoal feed Phnom Penh's annual energy demands alone. A 2009 Geres study found that Cambodia's garment industry also consumed significant quantities of wood -- over 2 million cubic feet each month -- to produce steam for ironing and dyeing clothes. This heavy use of firewood and charcoal has contributed to Cambodia's deforestation rates, greenhouse gas emissions, and instances of respiratory illness.

13. (U) The limited availability of electricity has similarly posed challenges to Cambodia's economic growth, environment, and health sectors. Only about 18 percent of the population is connected to the electricity grid, which runs on diesel generators, and only major urban areas have power 24 hours a day. Rural Cambodians pay among the world's highest prices for their electricity at as much as 50 to 60 cents per kilowatt-hour, compared to an average of 10 cents in the U.S. RGC officials complain, rightly so, about how the cost of electricity is a barrier to attracting industry and investors and limits services that facilities like health centers can provide.

CAMBODIA'S POTENTIAL FOR ENERGY FROM BIOMASS  
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14. (U) The RGC has emphasized large-scale energy solutions such as hydropower dams to address its energy issues. According to multiple

studies, however, biomass such as agricultural and municipal waste has the potential to become another significant, sustainable energy source; waste biomass can be used by direct combustion or can be converted into biogas or a range of liquid biofuels. A 2004 study by the Cambodian Ministry of the Environment (MOE), the Cambodian Research Center for Development (CRCD), and the Institute for Global Environmental Studies in Japan (IGES) estimated a potential generation of 18,852 GWh per year from waste products alone. (NOTE: This figure assumes that all waste products would be used for energy generation, which is unlikely. However, according to the same study, the production potential of 20 proposed hydropower projects showed a combined annual generating potential of only 8,839.97 GWh per year, so even half of Cambodia's biomass potential could be significant in comparison. END NOTE.)

#### AGRICULTURAL CASTOFFS MADE INTO ENERGY

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15. (U) Through small pilot projects, NGOs and private investors have recently begun to explore the most appropriate mechanisms for biomass energy production in Cambodia. Social enterprise SME Renewable Energy, for example, started in 2005 and now has 30 clients running biogasifiers on fine grains, corn cobs, and rice husks, which still release greenhouse gas emissions, although at a reduced rate. SME's clients include rice mills, ice plants, brick factories, and hotels. SME Managing Director Rin Seyha explained to ESTHoff that with a little help on upfront investments, primarily in the form of better interest rates on business loans, enterprises that took advantage of energy production from biomass could realize substantial long-term savings. An average 2 ton per hour rice mill could reduce its diesel consumption by approximately 15,800 gallons of fuel per year, a savings of \$30,000. SME's 30 clients have collectively reduced diesel consumption by up to 527,000 gallons per

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year, saving them \$750,000 to \$1 million and over 6,000 tons of carbon dioxide emissions, all by using materials that were essentially garbage as fuel.

#### GREEN COOKING WITH COCONUT CHARCOAL

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16. (U) Other organizations have begun to confront the issue of charcoal usage for cooking. For example, in 2004 Geres started to develop char briquettes from coconut waste and other industrial charcoal residues. The production process is energy efficient, with heat from the burning process being recaptured in a funnel and used to dry the waste biomass. When Phnom Penh's primary landfill, Stung Meanchey, closed in 2009, Geres established a new "Sustainable Green Fuel Enterprise" near the site to produce and commercialize the char briquettes.

17. (U) The enterprise set a production target of 1,100 pounds of briquettes each day by the end of 2009, with plans to double production by 2011. Although the price of the briquettes is currently slightly higher than that of traditional charcoal, Geres has noted that average charcoal prices have increased significantly from year to year (up 240% between 2007 and 2008 alone) as wood becomes more difficult to procure, so the briquettes will steadily become more competitive. This small enterprise alone, if successful, will reduce Cambodia's carbon emissions by an estimated 1,604 tons per year and employs up to 16 local residents.

#### CAPTURING METHANE FROM FARMS AND LANDFILLS

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18. (U) According to the MOE, the Cambodian agriculture sector contributes about 18% of the country's greenhouse gas emissions. Methane-capture projects that would lower some of these emissions have been slower to take off but still represent another potential source of biomass energy. One of the MOE's Clean Development Mechanism (CDM) projects, for example, is a methane-capture project at a pig farm in Kandal Province. Under the project, the Samrong Thom Animal Husbandry piggery uses an anaerobic reactor digestion system to capture methane generated from the facility's waste water, which is then used to fuel a generator to supply electricity to the

farm. The second phase of the project will expand production to supply electricity to other local users through a rural electricity enterprise (REE).

¶9. (U) A German company has also explored potential methane-capture schemes using organic and municipal waste at the Stung Meanchey landfill, which could potentially supply enough electricity to serve 3,000 families. A company spokesperson said that the project would be implemented over the next 15 years. However, Toch Sovanna, Director of the Ministry of Industry, Mines, and Energy's (MIME) Renewable Energy Department, said that as of year's end the company was still looking for partners with whom to implement the project.

#### COMMENT

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¶10. (SBU) There has been significant attention paid to Cambodia's large-scale energy development plans, but the kinds of energy solutions that deliver the most benefits to average Cambodians are smaller, more localized generation programs. The LMI provides an opportunity for the USG to support expansion of these types of solutions. For example, Post is encouraging Cambodia under the LMI to join the International Methane to Markets Partnership and would welcome Department support to expand U.S. Environmental Protection Agency or other USG technical support for the Partnership in Cambodia.

¶11. (SBU) The Cambodian government may also benefit from learning about other countries' experiences in rolling out small-scale renewable energy technologies. For example, Post invited an American expert on regulations that promote Very Small Power Producers (VSPPs) to present at the recent USG-sponsored GMS Energy Conference (Ref B); RGC officials subsequently expressed interest in exploring VSPP regulations for Cambodia. An exchange where RGC energy officials could see Thailand's VSPP program in action could be a useful activity to advance the initiative.

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